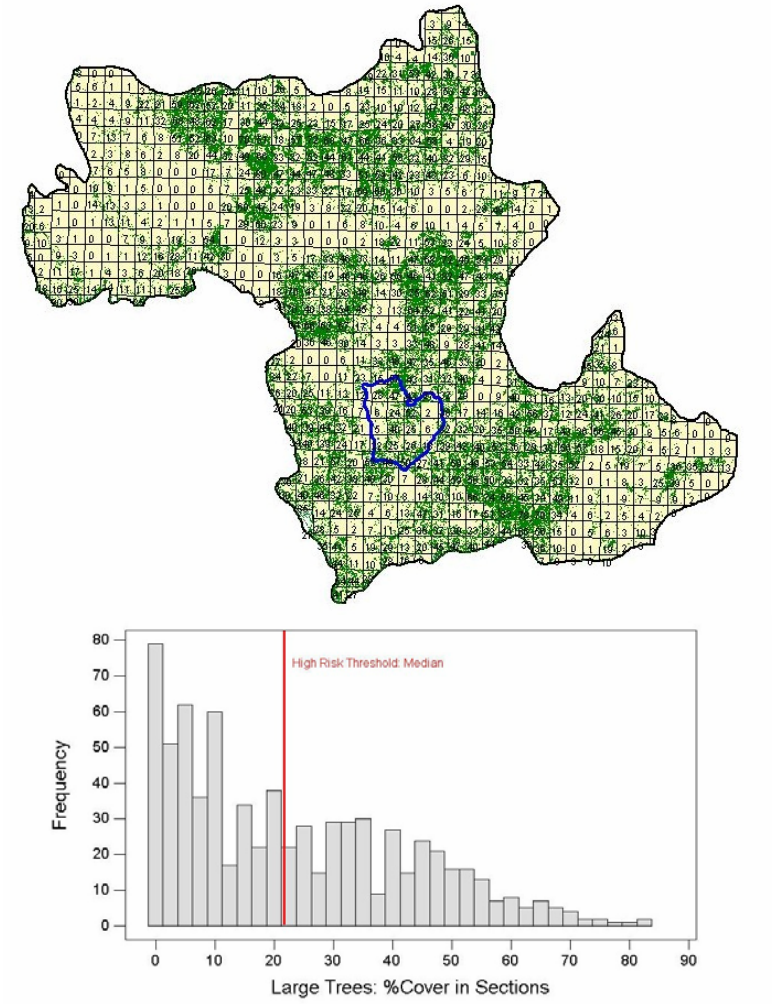
EXAMPLE ASSESSMENT METHODOLOGY

Cumulative Impact Assessment for Terrestrial Habitat Resources

CURRENT RANGE OF VARIABILITY AND RISK THRESHOLDS
Large Tree Measured Characteristic (Landsat) for the Blacks Mountain Sub-Ecoregion



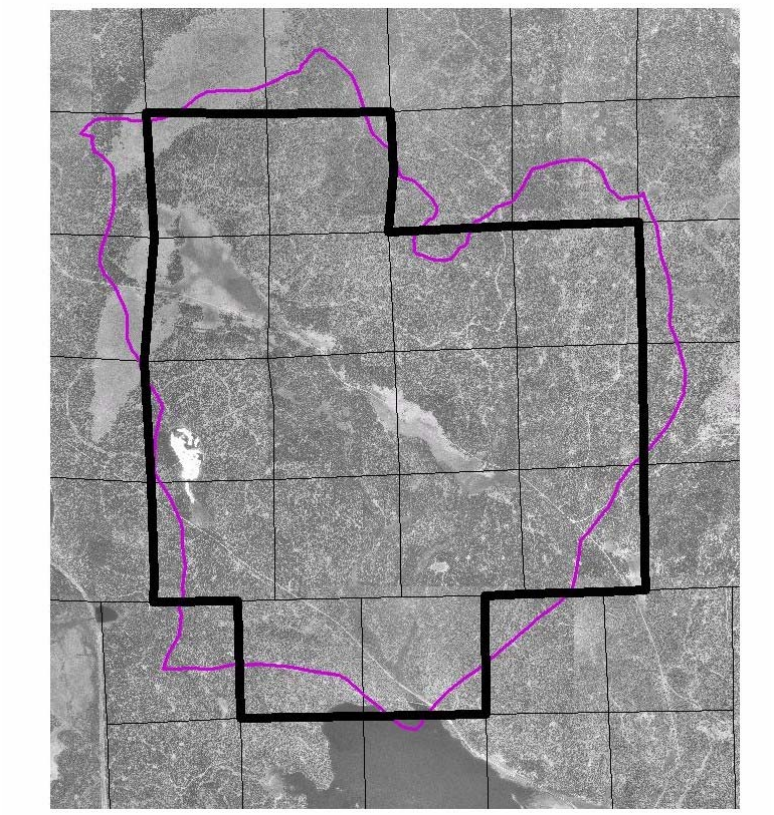
Legend:

- Blacks Mountain USDA Sub-Ecoregion
- Large Trees (Landsat 30 meter pixels)
- **25** CELL VALUE (percent of Section covered by large tree pixels)
- Bridges Creek Planning Watershed

In this example, a 440,000 acre sub-ecoregion on the east side of the Cascades has been used as the ranking scale for analyzing the current range of variability for the availability of the "large trees" measured characteristic. Note that Landsat imagery at the 30 meter pixel scale is used as a proxy for the occurrence of large trees greater than 24 inches in diameter at breast height. All large tree pixels are added up for square mile Sections. The sections are given a percent cover value (0 – 100), or "cell" value. The distribution of these cell values is shown in the histogram above. In this example, we set the high risk threshold at the 50th percentile condition (e.g., 20 percent cover for a Section).

For an example of using this threshold for assessment purposes, we now look at the Bridges Creek planning watershed within the sub-ecoregion.

MODIFIED PLANNING WATERSHED AS THE MONITORING SCALE



Legend:

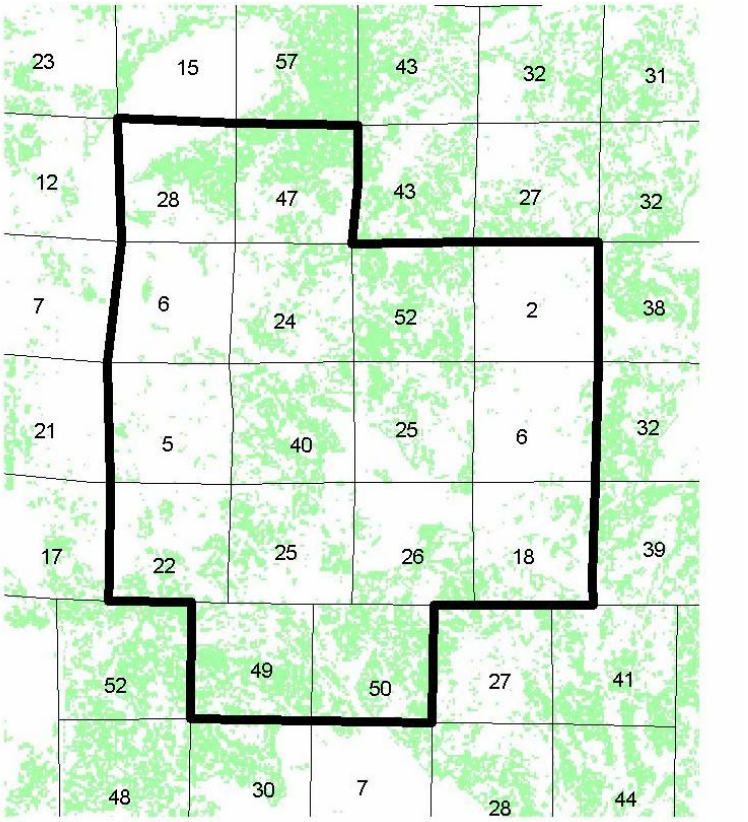
Calwater 2.2 Watershed Boundary

Modified Watershed Boundary (fitted to Sections)

The planning watershed is the monitoring scale for cumulative impact assessment. Unlike Biological Assessment Areas (BAA) for individual THPs, the watershed is a geographically constant unit for which measured characteristic trends and cumulative THP impacts can be monitored over time.

For assessment purposes, the boundary of a planning watershed is approximated as the boundary of the square-mile Sections that have at least half of their area included in the watershed.

BASELINE CONDITIONS FOR LARGE TREES



Legend:

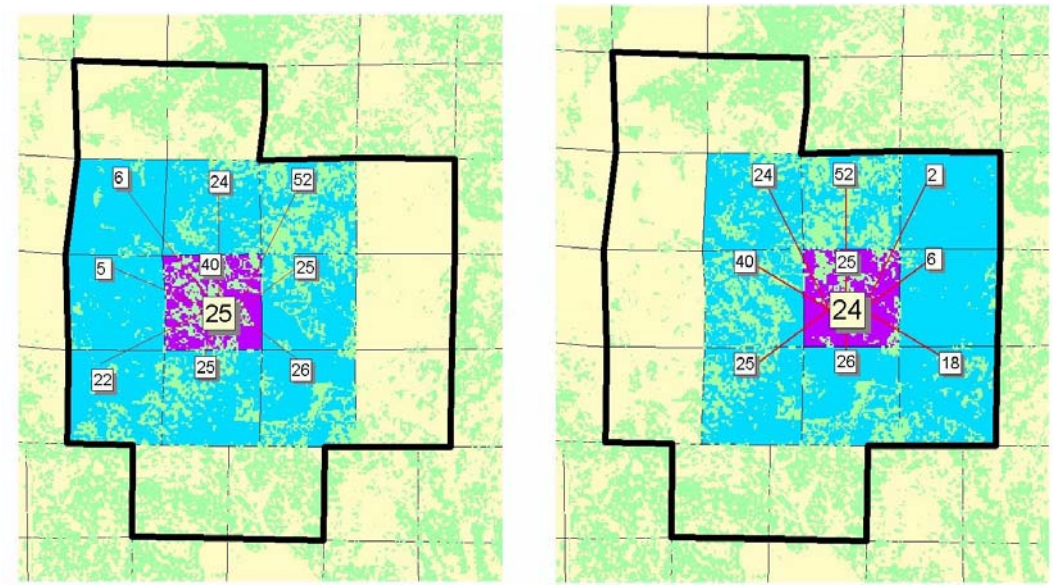
Watershed boundary

Large Trees (Landsat 30 meter pixels)

25 CELL VALUE: Percent of Section Covered by Large Tree Pixels

The large tree percent cover values for each Section is labeled above. These values are also called cell values.

MOVING WINDOW ANALYSIS FOR CELLS
Average of Nine Cell Values Around Each Section



Legend:

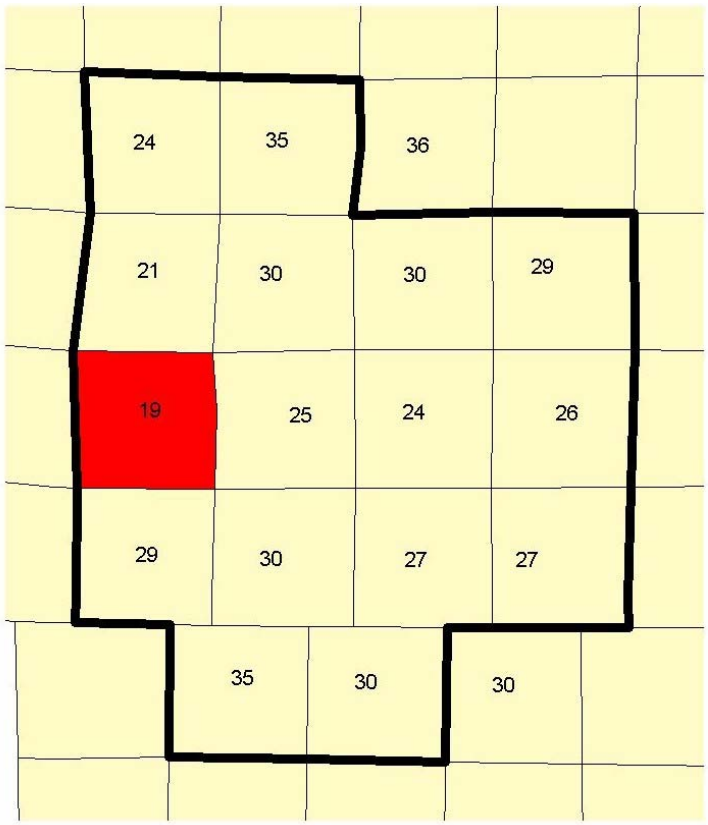
- Watershed boundary
- Large Trees (Landsat 30 meter pixels)
- Cell (square mile Section)
- Window (cell and all adjacent Sections)

52 — CELL VALUE (percent of Section covered by large tree pixels)

25 — WINDOW VALUE (average of all CELL VALUES in the window for a given cell)

For every Section, a window value is calculated as the average of the cell values for the Section and adjacent Sections. This window value represents the availability of large trees within about one mile of the Section of interest. Risk and significant impacts are assessed at this scale which represents habitat within a cell or accessible nearby. An animal (or population) either has a large enough home range to be able to use the resources in adjacent Sections, or individuals can disperse to the adjacent Section.

BASELINE RISK ASSESSMENT
Windows Values That Start Below 20



Legend:

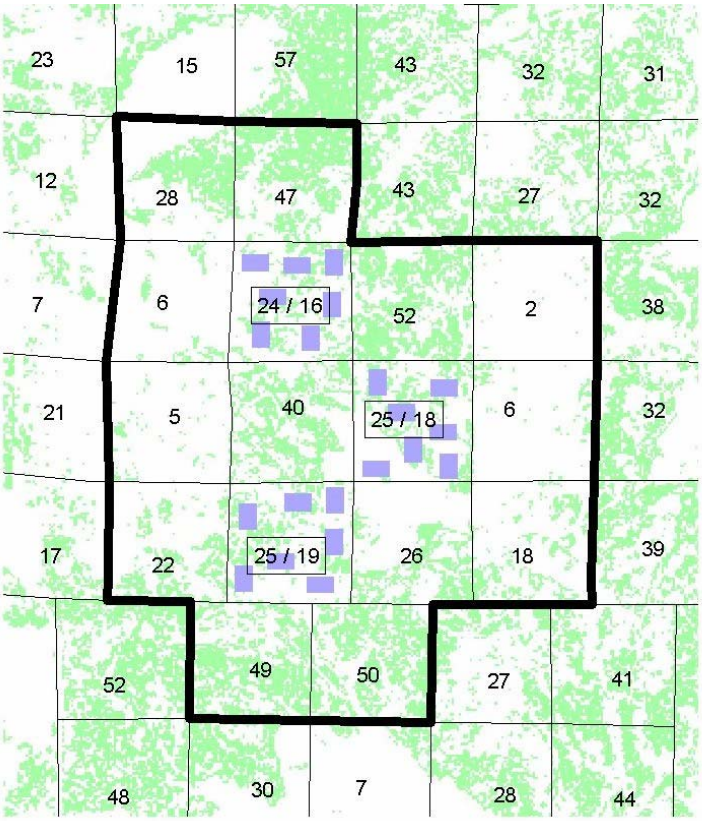
Watershed Boundary

High Risk Section (for large trees)

19 WINDOW VALUE (average of all large tree percent cover cell values for the window centered on a Section

The baseline Window values for the watershed are shown above. Note that one of the Sections is already below the high risk threshold. The window values for two Sections outside the watershed have also been labeled above because they will fall within the BAAs for the two THP featured later in this example. Note that while BAAs change with THPs, the planning watershed (e.g., monitoring scale) remains constant

LARGE TREE IMPACTS FROM THP ONE



Legend:

Watershed Boundary

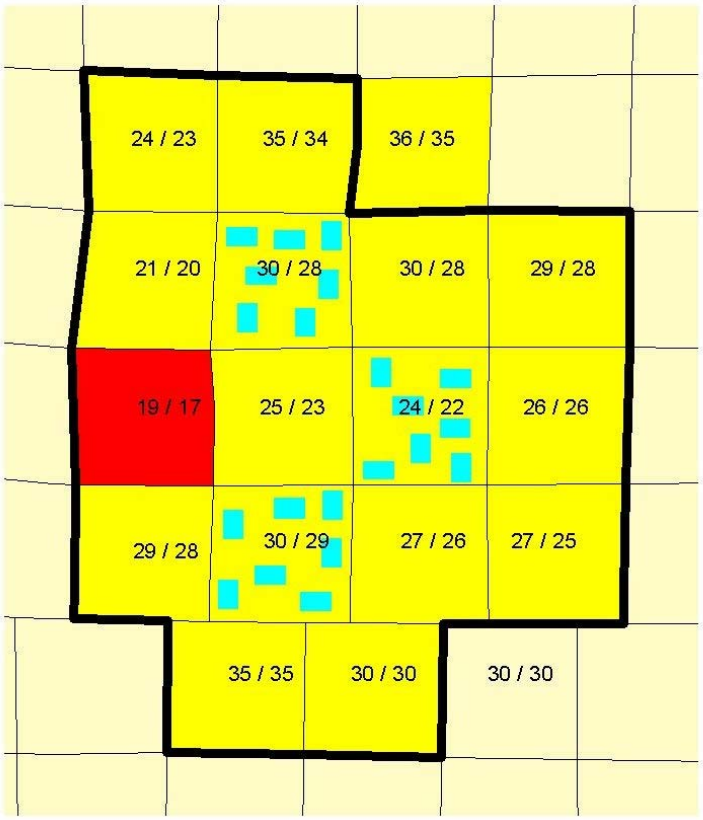
Large Trees (Landsat 30 meter pixels)

THP One: 20-acre Clearcuts

19 CELL VALUE (boxes show pre-harvest / post-harvest values)

Clearcuts from THP One reduce the large tree cell values in the three sections where harvesting occurs.

RISK ASSESSMENT FOR THP ONE
Windows Values That Drop Below 20

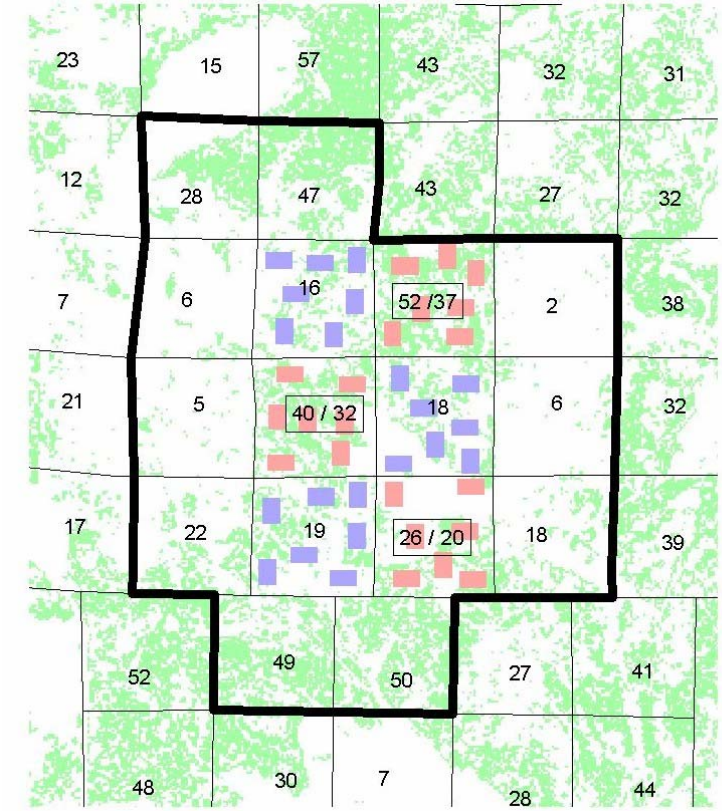


Legend:

	Watershed Boundary
	THP One: 20-acre Clearcuts
	Biological Assessment Area (BAA) for THP One
	High Risk Section (for large trees)
19 / 17	CELL VALUE (boxes show pre-harvest / post-harvest values)

The updated window values above suggest that the loss of large trees is not significant enough to cause the Window values of any more Sections in the BAA to drop below the high risk threshold.

LARGE TREES CUMULATIVE IMPACTS FROM THP TWO



Legend:

Watershed Boundary

Large Trees (Landsat 30 meter pixels)

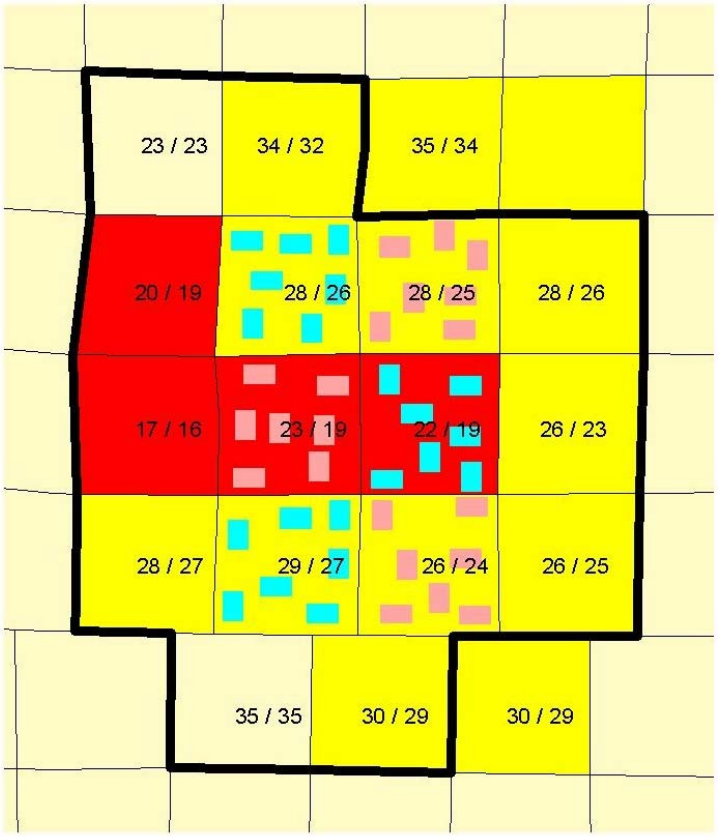
THP One: 20-acre Clearcuts

THP One: 20-acre Clearcuts

16 CELL VALUE (boxes show pre-harvest / post-harvest values)

Clearcuts from THP Two reduce the large tree cell values in three more sections.

RISK ASSESSMENT FOR THP TWO
Windows Values That Drop Below 20



Legend:

- Watershed Boundary
- THP One: 20-acre Clearcuts
- THP Two: 20-acre Clearcuts
- BAA for THP Two
- High Risk Section (for large trees)
- **17 / 16** CELL VALUE (boxes show pre-harvest / post-harvest values)

The effect of the second THP appears to trigger a cascading effect in terms of risk to meta-habitats (e.g., large open conifer, large closed conifer) related to the large trees measured characteristic. Three more Sections now fall below the high risk threshold because of the latest harvest. Only one of these Sections falls below the threshold because of the direct effect of the harvesting that occurs in that Section. The other two Sections move to a high risk status because harvesting in adjacent Sections reduces habitat availability at the window scale.

Over time, the cumulative impacts of successive THPs could be tracked at the watershed scale. Success could be judged as occurring if (in time) there are fewer high risk Sections, and the average cell value for the watershed increases.